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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,963	08/27/2003	Akira Matsunami	TI-35921 (032350.B519)	4707
23494	7590	09/09/2005	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED			CAO, PHAT X	
P O BOX 655474, M/S 3999			ART UNIT	
DALLAS, TX 75265			PAPER NUMBER	

2814

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H'D

Office Action Summary	Application No.	Applicant(s)	
	10/648,963	MATSUNAMI, AKIRA	
	Examiner	Art Unit	
	Phat X. Cao	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The cancellation of claims 1-15 and 23-28 in Paper filed on 6/22/05 is acknowledged.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 16-18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Fukasawa et al (US. 4,871,110).

Fukasawa (Fig. 1) discloses a ball film for fabricating integrated circuits, comprising: a thin film 1 formed from two separate thin films 2 and 3 and comprising a plurality of slots 5; and a plurality of metal balls 9 each movably contained within a respective one of the plurality of slots 5, wherein the slots 5 are spherically shaped and the metal balls 9 are formed from solder (column 2, lines 16-22).

3. Claims 16, 18, 20 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Ochiai et al (US. 5,643,831).

Ochiai (Fig. 1C) discloses a ball film for fabricating integrated circuits, comprising: a thin film 10 formed from two separate thin films 1 and 2 and comprising a plurality of slots 12; and a plurality of metal balls 20 each movably contained within a respective one of the plurality of slots 12, wherein the metal balls 20 are formed from solder and each has a diameter of 100 um (column 5, lines 11-14).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukasawa et al or Ochiai et al in view of Ball (US. 6,426,564).

Neither Fukasawa nor Ochiai discloses that the thin film is made of polyimide.

However, Ball (Fig. 8A) teaches a ball film comprising a thin film 20 of polyimide (column 6, lines 8-13) comprising a plurality of slots 22. Accordingly, it would have been obvious to form the thin film of Fukasawa or Ochiai with polyimide material because polyimide is non-wettable and is able to withstand the thermal stresses induced by thermal expansion mismatch between the integrated circuit die and the thin film, as taught by Ball (column 6, lines 13-20).

5. Claims 19 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukasawa et al (US. 4,871,110) in view of Hayes (US. 5,861,323).

Regarding claim 19, Fukasawa does not disclose that the thin film 1 is made of polyimide.

However, Hayes (Fig. 3) teaches a ball film comprising a thin film 22 made of polyimide and comprising a plurality of slots 24. Accordingly, it would have been obvious to form the thin film of Fukasawa with polyimide material because polyimide is also an insulating material, as taught by Hayes (column 3, lines 35-38).

Regarding claims 21-22, Hayes further teaches that the thin film 22 comprises a thickness of between 15 um and 125 um (column 3, lines 39-41), and the metal balls 86 each has a diameter of between 50 um and 800 um (column 3, lines 43-45).

Accordingly, it would have been obvious to form the thickness of the thin film and the diameter of the metal ball of Fukasawa with the dimensions as claimed because the thickness of the thin film can be optimized depending upon the size of the metal balls used, as taught by Hayes (column 3, lines 39-43).

Response to Arguments

6. Applicant's arguments with respect to the previous rejection(s) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

However, upon further consideration, a new ground(s) of rejection is made in view of the new references cited.

Conclusion

7. This action is made non-final.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is 571-272-1703. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2814

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PC
September 2, 2005


PHAT X. CAO
PRIMARY EXAMINER